



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT

This information disclosure statement is being submitted to supplement the Information Disclosure Statement which applicants filed on November 25, 2002.

In Table 1 of the prior IDS, applicants listed those examples of the references of record in this application for which Corning Incorporated, the assignee of this application, has measured at least one of density, CTE, liquidus temperature, or liquidus viscosity. A copy of Table 1 is attached hereto as Exhibit A.

At pages 1-2 of the November 25th IDS, applicants stated the following with regard to References 1-2 and 5-10 of Table 1:

Each of the listed examples of References 1-2 and 5-10 of Table 1 had a CTE as measured by Corning or reported in the reference that was outside the $28-33 \times 10^{-7}/^{\circ}\text{C}$ range specified in applicants' independent Claims 1 and 30. Specifically, the CTE's were greater than $33 \times 10^{-7}/^{\circ}\text{C}$, the smallest CTE of any of the listed examples being $34.6 \times 10^{-7}/^{\circ}\text{C}$ for example 15 of Reference 2. Although some of these examples have measured or reported property values that are within the ranges of Claims 1 and 30, these high CTE values are believed to fully distinguish these examples.

In connection with the prosecution of another Corning application relating to LCD glasses, i.e., reissue application number 10/141,286, a question was raised regarding how CTE values reported in a reference should be interpreted if the reference does not associate a specific temperature range with the CTE value. In particular, the examiner for the '286 reissue application raised this issue in connection with a §102(b) rejection based on U.S. Patent No. 5,244,847:

With regard to the limitation of the CTE [of applicant's claims], while it is noted that Example 9 [of U.S. Patent No. 5,244,847] does disclose that the Thermal expansion coefficient is $44 \times 10^{-7}/^{\circ}\text{C}$, there is no temperature range disclosed for this particular CTE value, therefore it is presumed that the disclosed composition will have a CTE value within the claimed range for the claimed temperature range, since the reference discloses a composition within the claimed ranges. (11/12/02 Office Action for reissue application number 10/141,286 at page 5.)¹

The temperature range for CTE values used in the claims of the '286 reissue application is 0-300°C, which is the same temperature range used in the claims of the present application. The CTE range of the independent claims of the '286 reissue application is $30-40 \times 10^{-7}/^{\circ}\text{C}$, while that of the claims of the present application is $28-33 \times 10^{-7}/^{\circ}\text{C}$.

To address the above rejection in the '286 reissue application, Corning has conducted an investigation to determine the effects of temperature range on CTE values. That investigation was conducted after the filing of the November 25th IDS for this application.

Attached as Exhibit C is a description of the protocol Corning followed to determine CTE values for a sample of its commercial Glass Composition No. 1737 for the following temperature ranges which appear in the patent literature relating to LCD glasses: 0-300°C, 25-300°C, 50-300°C, 30-380°C, 50-350°C, and

¹ A copy of the 11/12/02 Office Action for reissue application number 10/141,286 is attached as Exhibit B. A copy of U.S. Patent No. 5,244,847 cited in that Office Action is submitted herewith and listed on the accompanying Supplemental Listing Under 37 CFR §1.198(a).

100-300°C. Corning's Glass Composition No. 1737 is the comparative example of Table 1 of this application (see page 13 of applicants' specification).

As explained in Exhibit C, the 0-300°C temperature range was found to result in a CTE value lower than that for the other temperature ranges. In particular, it was found that values for the other ranges could be transformed to a value for the 0-300°C range by subtracting an offset. The magnitude of the offset varies with the range being transformed, the minimum offset being $-0.8 \times 10^{-7}/^{\circ}\text{C}$ in the case of a transformation from the 25-300°C range to the 0-300°C range and the maximum offset being $-2.7 \times 10^{-7}/^{\circ}\text{C}$ in the case of a transformation from the 100-300°C range to the 0-300°C range. The particular value of the offset for each of the temperature ranges listed above is set forth in Exhibit C.

Although these offsets were obtained for a particular composition, i.e., for Corning's Glass Composition No. 1737, Corning believes that they should be applicable to other LCD glass compositions which use SiO_2 , B_2O_3 , and Al_2O_3 as glass formers and MgO , CaO , SrO , and/or BaO as modifiers.

Using the results of this investigation, the reported and measured CTE values for the examples of References 1-2 and 5-10 of Table 1 of the prior IDS have been reviewed. The results of that review are set forth in Exhibit D. As shown in that exhibit, each of the listed examples of References 1-2 and 5-10 of Table 1 continues to have a CTE for the 0-300°C range as measured by Corning or reported in the reference that is outside the $28-33 \times 10^{-7}/^{\circ}\text{C}$ range specified in applicants' independent Claims 1 and 30.²

Because of the offsets, the lowest CTE for the 0-300°C range for these examples is that reported for Example 5 of Reference 7, rather than that for Example 15 of Reference 2. For Example 5, Reference 7 reports a CTE of

² As discussed in the November 25th IDS, Reference 3 is the Nishizawa reference cited in the March 5, 2002 Office Action for this application and is distinguished from applicants' claims based on liquidus viscosity. As to Reference 4, Corning has not measured and the reference does not report CTE or liquidus viscosity values. The liquidus temperature values which Corning has measured for Examples 4, 5, 6, and 14 of this reference are set forth in the November 25th IDS.

$36 \times 10^{-7}/^{\circ}\text{C}$ for the $100\text{-}300^{\circ}\text{C}$ range, which becomes $33.3 \times 10^{-7}/^{\circ}\text{C}$ when transformed to the $0\text{-}300^{\circ}\text{C}$ range using an offset of $-2.7 \times 10^{-7}/^{\circ}\text{C}$. Significantly, this example has a composition which falls outside of applicants' Claims 1 and 30, e.g., the example has only 4.0 mol% CaO, while each of Claims 1 and 30 requires a minimum of 5.0 mol% CaO. Also, Corning's measured value for the CTE of this example for the $0\text{-}300^{\circ}\text{C}$ range is $35.5 \times 10^{-7}/^{\circ}\text{C}$.

In addition to Table 1 of the November 25th IDS, applicants also discussed CTE values in the amendment filed in this application on July 3, 2002. Specifically, CTE values were discussed in connection with applicants' comments regarding Kohli PCT Publication No. WO 98/27019 (Kohli), Dumbaugh, Jr. et. al. U.S. Patent No. 5,374,595 (Dumbaugh), and Moffatt et al., U.S. Patent No. 5,508,237 (Moffatt).

The CTE values of the Dumbaugh and Moffatt patents are reported for the $0\text{-}300^{\circ}\text{C}$ range (see column 6, lines 24-26, of the Dumbaugh patent, and column 6, line 65, to column 7, line 1, of the Moffatt patent), and thus no offset needs to be applied to these values.

The CTE values of the Kohli reference are for the $25\text{-}300^{\circ}\text{C}$ range (see page 7, lines 26-28, of the Kohli reference). For that range, Examples 8, 9, 10, and 14 have a CTE of less than $33 \times 10^{-7}/^{\circ}\text{C}$, and application of the $-0.8 \times 10^{-7}/^{\circ}\text{C}$ offset for transforming CTE values from the $25\text{-}300^{\circ}\text{C}$ range to the $0\text{-}300^{\circ}\text{C}$ range does not move the CTE values for these examples below the lower limit of $28 \times 10^{-7}/^{\circ}\text{C}$ of applicants' independent Claims 1 and 30.

These examples, however, do not fall within the scope of applicants' claims because their liquidus viscosities are too low. As shown in the Supplemental Declaration of Josef C. Lapp Under 37 CFR §1.132 filed on July 3, 2002 (the Supplemental Lapp Declaration) and discussed in applicants' July 3rd Amendment, each of Examples 8, 9, 10, and 14 of the Kohli reference has a liquidus viscosity which is substantially less than the lower limit for liquidus viscosity specified in applicants' independent Claims 1 and 30 (i.e., greater than about 200,000 poise).

As for the remaining examples of the Kohli reference, application of the $-0.8 \times 10^{-7}/^{\circ}\text{C}$ offset leaves their CTE values above $33 \times 10^{-7}/^{\circ}\text{C}$, except for Example 15 which becomes $32.8 \times 10^{-7}/^{\circ}\text{C}$. Example 15, however, was tested along with Examples 8, 9, 10, and 14 and, like those examples, was found to have a liquidus viscosity outside of applicants' claims. See the Supplemental Lapp Declaration at ¶5.

Thus, in the case of both the November 25th IDS and the July 3rd Amendment, applicants believe that the question regarding the effects of temperature range on CTE values raised during the prosecution of the '286 reissue application does not change the fundamental conclusion that applicants' independent Claims 1 and 30 (as well as their dependent claims) fully distinguish the art.

In addition to the experimental data of Table 1, Corning has also analyzed the compositions and properties of certain commercial LCD glasses sold by other glass companies, specifically, Glass Composition No. NA-35 sold by NH Technoglass, Glass Composition No. AN-100 sold by Asahi, the named assignee of U.S. Patent No. 5,801,109 in Table 1, and Glass Composition Nos. OA-10 and OA-21, sold by Nippon Electric Glass (NEG), the named assignee of U.S. Patent No. 5,851,939 in Table 1. Each of these compositions was commercially available prior to the priority date of this application, except for NEG's OA-21 which to Corning's knowledge, was not introduced until late 2000 or early 2001. Exhibit E sets forth the compositions and relevant properties which Corning has measured for these LCD glasses.

Finally, a copy of U.S. Patent No. 2,231,811, which is the U.S. counterpart of GB 479,173 previously made of record and which includes property information not included in the GB patent, is enclosed. A full translation of JP 9-156953 for which an English language abstract was previously submitted is also enclosed, as well as copies of U.S. Patent No. 6,250,111 and Japanese Patent Publications Nos. JP 8-034634 and JP 9-169538. These references are listed on the Supplemental Listing Under 37 CFR §1.198(a) submitted herewith.

Applicants respectfully submit that the additional references and information submitted herewith do not anticipate or render obvious any of their claims. Consideration of these materials in connection with the prosecution of this application is respectfully requested.

Respectfully submitted,

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